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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,101	10/16/2001	Saku Lahti	297-010577-US(PAR)	5357

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EXAMINER	
PENDLETON, DIONNE	

ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/981,101	LAHTI ET AL.	
	Examiner	Art Unit	
	Dionne H. Pendleton	2646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *21 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-32 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-32 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claims 1-12, 14-17,26,27 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Figures 1 and 2 of the Applicant's Admitted Prior art**, in view of **Takahashi et al (US 5,634,204).**

Regarding claim 1, **Prior art figure 2** illustrates, a method for receiving radio frequency signals, said method comprising the steps of: receiving a first received signal component of the radio signal using a first antenna **101a** having first properties and receiving a second received signal component of the radio signal using a second antenna **101b** having second properties, which are different from the first properties; processing a received signal component to produce a sampled signal component having an In-phase and a Quadrature-phase component (see discussion of the RF component in the spec. page 2, lines 9-152); producing at least one combined signal *Sc in figure* 2, which is a linear combination of at least two signal components; and selecting at least one set of complex values for coefficients of the linear combination so that a quality of a combined signal corresponding to each set of coefficient values is at a

certain time at least equal to a quality of the one of the sampled signal components having the best quality.

Prior art **figure 2** does not clearly teach that the at least one combined signal *Sc*, is a linear combination of at least two *sampled* signal components, and further neglects to clearly teach alternately connecting the antennas via a switching element to radio frequency means so that the received signal components are interleav[ed] with each other with respect to time and so that a first part of a certain piece of transmitted information is received with the first antenna and a second part of said piece of transmitted information is received with the second antenna.

In **figure 1(a) and figure 3**, Takahashi teaches alternately connecting two antennas **A,B** via a switching element **2** to radio frequency means **4** such that *sampled* signal components from each antenna are interleav[ed] with each other with respect to time **(see figure 3)** and so that a first part of a certain piece of transmitted information is received with the first antenna and a second part of said piece of transmitted information is received with the second antenna.

It would have been obvious for one of ordinary skill in the art at the time of the invention to alter the Prior art such that it includes a selectable switch for selecting an appropriate antenna, as taught by Takahashi, for the purpose of providing a mobile radio communication apparatus with a method of selecting a transmission path with minimal deterioration of incoming signals.

Regarding claim 2, in **column 3, line 58 – column 4, line 17**, Takahashi appears to teach that sets of coefficient values is/are selected using a combination of factors

including the condition of the transmission path, the properties of the received signals etc. reading on "signal-to-noise ratio" as a measure of the quality of a signal.

Regarding claim 3, in the Applicant's discussion of the prior art on **page 3** of the specification, the Applicant admits that it's well known in the prior art to select the coefficient values by minimizing the effect of multipath propagation.

Regarding claim 4, on **page 3 lines 4-6**, the Prior art appears to teach that the polarization properties of the combined signal may be adjusted.

Regarding claim 5, on **page 3, lines 15-27**, the Prior art appears to teach that the angular properties of the combined signal may be adjusted.

Regarding claim 6, shown in **Prior art figure 2**, and discussed in the **first paragraph of page 4** in the specification, the Prior art teaches that the spatial properties of the first antenna and the second antenna are different.

Regarding claim 7, in **page 2, lines 19-21**, the Prior art appears to teach that the radio signal is a narrow spectrum signal comprising a sequence of symbols and said piece of transmitted information is a symbol.

Regarding claim 8, **Prior art figure 1** teaches that wherein a spread spectrum signal, corresponding to at least one sequence of data bits spread with a spreading code, is received, and said method further comprises the step of correlating **via 113** the received signal components at a certain phase after the receipt of signal components with at least one local spreading code.

Regarding claim 9, in **page 2, line 17-18**, the Prior art appears to teach that the received signal components are correlated with the local spreading codes before they are sampled.

Regarding claim 10, in **page 2, lines 4-27**, Prior art appears to teach that the sampled signal components are correlated (**via 113 in figure 1)** with the local spreading codes.

Regarding claim 11, **Prior art figure 1** teaches that the combined signals are correlated with the local spreading codes.

Regarding claim 12, as is well understood in the art, the Prior art teaches that the spreading code consists of a repeated sequence of chips lasting a certain time period, and wherein transmitted data comprises a first or second sequence of chips in combination with a certain data bit, and wherein the first antenna receives the first sequence of chips combined with a certain data bit, and further wherein the second antenna receives a second sequence of chips in combination with a certain data bit.

Regarding claim 14, The Prior art appears to teach that said piece of transmitted information is a chip, **as broadly claimed,** which is received using at least two antennas **101a, 101b**.

Regarding claim 15, **Prior art figure 2** illustrates a receiver device comprising at least a first antenna **101a** having certain first properties, which is arranged to receive a first signal component, and a second antenna **101b** having certain second properties, which second properties are different from the first properties and which second antenna is arranged to receive a second signal component, processing means **100**

arranged to process a signal component received with an antenna to a sampled signal component having an In-phase and a Quadrature-phase component, combination means **201** arranged to linearly combine sampled signal components to at least one combined signal.

In **figure 1(a) and figure 3**, Takahashi teaches alternately connecting two antennas **A,B** via a switching element **2** to radio frequency means **4** so that the received signal components are interleaving each other with respect to time **(see figure 3)** and so that a first part of a certain piece of transmitted information is received with the first antenna and a second part of said piece of transmitted information is received with the second antenna.

It would have been obvious for one of ordinary skill in the art at the time of the invention to alter the Prior art such that it includes a selectable switch for selecting an appropriate antenna, as taught by Takahashi, for the purpose of providing a mobile radio communication apparatus with a method of selecting a transmission path with minimal deterioration of incoming signals.

Regarding claim 16, in **figure 1(a),** Takahashi teaches a receiver device further comprising second selection means **8,** which are arranged to select, based on the quality of the received signal components, a constant switch position for the switching means **2** for a certain period of time.

Regarding claim 17, on **page 3 lines 4-6**, the Prior art appears to teach that the polarization properties of the combined signal may be adjusted.

Regarding claim 26, on **page 3, lines 15-27**, the Prior art appears to teach that the angular properties of the combined signal may be adjusted.

Regarding claim 27, shown in **Prior art figure 2**, and discussed in the **first paragraph of page 4** in the specification, the Prior art teaches that the spatial properties of the first antenna and the second antenna are different.

Regarding claim 28, Prior art **Figure 1**, teaches correlation means **113** arranged to correlate with the received signal at least one local spreading code.

2. **Claims 13,18,29 and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Figures 1 and 2 of the Applicant's Admitted Prior art**, in view of **Takahashi et al (US 5,634,204)** as applied to claim **17 and 28** above, and further in view of **Jones (US 6,531,985).**

Regarding claim 18, the combination of the Admitted prior art and Takahashi, does not clearly teach that the first antenna is right hand circularly polarized antenna and the second antenna is a left hand circularly polarized antenna.

In **column 11, lines 42-56**, Jones teaches that in mobile electronic devices, circularly polarized antennas provide the benefit of working better in different operating environments. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of the Admitted Prior art, Takahashi and Jones, using antennas being circularly polarized in the right and left hand directions, for the reasons stated.

Regarding claim 13, in **column 11, lines 1-7**, Jones teaches that a mobile station with the disclosed antenna arrangement may include GPS applications.

The combination of the Prior Art, Takahashi and Jones does not clearly teach Coarse Acquisition local spreading codes OR that a duration of repeated sequence of chips is an Epoch. However, the Examiner takes Official Notice that it is well known in the art that the code available for civilian applications are called C/A (coarse acquisition) codes, and furthermore, it is obvious that such codes have a certain chipping rate and repetition period for a given code period or Epoch. (for support, see cited references, provided below).

Regarding claims 29 and 30, in **column 11, lines 1-7**, Jones teaches that a mobile station with the disclosed antenna arrangement may include GPS applications.

3. **Claims 19 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Figures 1 and 2 of the Applicant's Admitted Prior art**, in view of **Takahashi et al (US 5,634,204)** and **Jones (US 6,531,985)** as applied to claim **18** above, and further in view of **Edvardsson (US 6,334,048)**

Regarding claim 19, The combination of the Admitted Prior art, Takahashi and Jones, does not clearly teach that the first antenna and the second antenna are arranged as a single dual sense antenna having a first feed for right hand circularly polarized operation and a second feed for left hand polarized operation.

In figure 1, Edvardsson teaches a single dual sense antenna **10** having a first feed **20** for right hand circularly polarized operation and a second feed **20** for left hand

polarized operation. Also see **column 4, lines 15-18.** In **column 5, lines 35-38,** Edvardsson teaches that an antenna, so constructed, has use for receiving signals in positioning systems using satellites e.g. GPs. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to alter the teachings of the Admitted Prior art, Takahashi and Jones, as taught by Edvardsson, for the reasons stated.

Regarding claim 20, in **column 11, lines 1-7**, Jones teaches a benefit of using patch antennas in mobile devices having GPS applications, the combined disclosures of the references thereby reading on "a dual sense patch antenna".

4. Claims **21,22 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Figures 1 and 2 of the Applicant's Admitted Prior art**, in view of **Takahashi (US 6,067,449)** as applied to claim **17** above, and further in view of **Edvardsson (US 6,334,048).**

Regarding claim 21, the Takahashi reference teaches the use of first and second differently polarized antennas. The combined teachings of the Admitted Prior art and Takahashi, does not clearly teach that the first and second antennas are linearly polarized.

In column 5, lines 49-57, Edvardsson discloses that linearly polarized antennas in mobile communication devices have utility in terrestrial communication systems. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of the Prior art, Takahashi and Edvardsson, using two linearly

polarized antennas, thereby adapting the mobile communication device for operation in terrestrial systems such as GSM, PCN, PCS, cellular and others.

Regarding claim 22, claim 22 is rejected for the same reasons set forth in the rejection of claim 19. Also see **figure 2** in the Edvardsson reference and the discussion of figure 2 in **column 5, line 58 – column 6, line 6**.

Regarding claim 25, shown by phasing network **21** in figure 1, Edvardsson teaches "the first linearly polarized antenna is arranged to have polarization properties which are substantially orthogonal to the polarization properties of the second linearly polarized antenna."

5. **Claims 23 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Figures 1 and 2 of the Applicant's Admitted Prior art**, in view of **Takahashi et al (US 5,634,204)** and **Edvardsson (US 6,334,048)** as applied to claim **21** above, and further in view of **Jones (US 6,531,985).**

Regarding claim 23, the combination of the Admitted Prior art, Takahashi and Edvardsson neglects to clearly teach a dual polarized patch antenna. However, in **column 11, lines 1-7**, Jones teaches the use of "a dual polarized patch antenna". It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of the Admitted Prior art, Takahashi, Edvardsson and Jones, since using dual polarized patch antennas in mobile devices provides the benefit of working better in different operating environments.

Regarding claim 24, in **column 11, lines 31-40**, Jones teaches that F antennas may be substituted by one of ordinary skill in the art, without undue experimentation. The combined disclosures of the references thereby teaching " wherein the first antenna is a first planar inverted F antenna and the second antenna is a second planar inverted F antenna, whose direction is different from the direction of the first antenna."

6. **Claims 31 and 32** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Figures 1 and 2 of the Applicant's Admitted Prior art**, in view of **Takahashi et al (US 5,634,204)** and further in view of **Chang (US 5,692,019).**

Regarding claims 31 and 32, the combined teachings of the Admitted Prior art and Takahashi neglects to clearly teach in said connecting step that the switch element is operative to switch continually based upon the duration of a parameter, and wherein the parameter is one of a bit, an epoch, a symbol or a chip.

However, in **column 4, lines 5-35,** Chang teaches a communication device having antenna switch diversity, wherein the switch **420** is operative to continually switch between the first antenna **410** and second antenna **412** based on the long-term signal power, medium-term signal power and short-term signal power measurements i.e., "parameter of the signal components". Chang further teaches that the parameter is measured in symbol periods, which reads on "duration of a parameter".

It would have been obvious for one of ordinary skill in the art at the time of the invention to alter Takahashi per the teachings of Chang, for the purpose of continuously evaluating and selecting that signal having optimal signal strength and signal integrity.

Response to Arguments

7. Applicant's arguments filed 12/21/2005 have been fully considered but they are not persuasive.

a. Regarding the Applicant's argument that: **Figure 2 Of The Applicant's Admitted Prior Art Fails To Teach The Production Of One Combined Signal, Which Is A Linear Combination Of At Least Two Sampled Signal Components:**

Thought the Examiner is not convinced that output signal ***Sc*** , illustrated in **figure 2** of the Applicant's Admitted Prior Art, fails anticipates the one combined signal of the claim, the Examiner also relies upon **figure 3** of the Takahashi reference which illustrates at **(C)** a combined signal which represents the linear combination of at least two sampled signal components from the first antenna and second antenna. Therefore, the combined teachings of the Admitted Prior Art Figures 1-2 and the Takahashi references are held as anticipating the claim limitation, hence the art rejection is maintained.

b. Regarding the Applicant's argument that **The Takahashi Reference Fails To Teach That Switching Occurs Within An Interval Of Time Equal To The Duration Of A Bit, Epoch, Symbol Or Chip Sequence:**

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., duration of a parameter...parameter is a bit, an epoch, a symbol or a chip, are not recited in the rejected claim(s). Although the claims are interpreted in light of the

specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dionne H. Pendleton whose telephone number is 571-272-7497. The examiner can normally be reached on 9-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dionne Pendleton

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